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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DAVID L. GRAUMANN

Appeal 2008-5622
Application 09/603,939
Technology Center 2600

Decided: June 1, 2009

Before KENNETH W. HAIRSTON, MARC S. HOFF, and CARLA M. KRIVAK, *Administrative Patent Judges*.

HAIRSTON, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134 from a final rejection of claims 1 to 20 and 30 to 36. We have jurisdiction under 35 U.S.C. § 6(b).

We will reverse the rejections.

Appellant has invented a method and system for generating an enhanced telephone transmission signal in the frequency domain. The enhanced telephone transmission signal is comprised of a carrier signal that is modulated with a data signal to form a modulated carrier signal at a carrier

frequency, a masking signal that masks the carrier signal from being audible by a human ear, and an audio signal with a frequency band removed that surrounds the carrier frequency (Fig. 3; Spec. 4 to 10; Abstract).

Claims 1 and 30 are representative of the claims on appeal, and they read as follows:

1. A method of generating an enhanced acoustic transmission signal, the method comprising:
generating a carrier signal;
receiving data and generating a data signal representing the data;
modulating the carrier signal with the data signal to form a modulated carrier signal at a carrier frequency;
generating a masking signal to mask the modulated carrier signal from being audible by a human ear;
receiving audio and generating an audio signal based on the audio;
removing a frequency band surrounding the carrier frequency from the audio signal; and
combining the modulated carrier signal, the masking signal, and the audio signal to form the enhanced acoustic transmission signal.

30. A method to generate an output audio signal, comprising:
removing a range of frequencies in an audio signal to produce a notched audio signal;
generating a masking signal that falls entirely within one portion of the range of frequencies;
generating a data signal that falls entirely within the range of frequencies and apart from the one portion; and
combining the notched audio signal, the masking signal, and the data signal to form the output audio signal.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Bassani	US 4,035,838	July 12, 1977
Best	US 4,876,617	Oct. 24, 1989
Neubauer	US 6,584,138 B1	Jun. 24, 2003
		(filed Jan. 24, 1997)

Boney, “Digital Watermarks for Audio Signals,” IEEE Proceedings of MULTIMEDIA ’96, 1996, pages 473 to 480.

The Examiner rejected claims 30 to 36 under 35 U.S.C. § 102(b) based upon the teachings of Best.

The Examiner rejected claims 1, 2, 4, 5, 9, 10, 12, 13, 16, and 17 under 35 U.S.C. § 103(a) based upon the teachings of Neubauer and Best.

The Examiner rejected claims 6, 14, and 15 under 35 U.S.C. § 103(a) based upon the teachings of Neubauer, Best, and Boney.

The Examiner rejected claims 3 and 11 under 35 U.S.C. § 103(a) based upon the teachings of Neubauer, Best, and Bassani.

The Examiner rejected claims 7, 8, 18, and 19 under 35 U.S.C. § 103(a) based upon the teachings of Neubauer.

The Examiner rejected claim 20 under 35 U.S.C. § 103(a) based upon the teachings of Neubauer and Boney.

ISSUES

Anticipation

With respect to claim 30, Appellant argues (Br. 13) that “[e]ven if the programme signal that passes through filters 10, 11 could be considered a masking signal, such a masking signal spanning the frequency range of 1-6 kHz would not fall entirely within one portion of either of the notches at 2883 Hz and 3417 Hz.” Appellant additionally argues (Br. 13) that “Best also fails to disclose receiving a combined audio signal including a masking signal residing in a frequency range, a data signal residing in the frequency range, and audio information residing outside the frequency range and separating the masking and the data signal from the audio information, as recited in independent claim 34.” Thus, the issues before us are:

Has Appellant shown that the Examiner erred by finding that Best generates a masking signal that falls entirely within one portion of the range of frequencies removed from the audio signal to produce a notched audio signal?

Has Appellant shown that the Examiner erred by finding that Best describes audio information with a frequency residing outside of the frequency range of the masking signal?

Obviousness

Appellant argues (Br. 17, 18, and 20) that the applied references fail to teach the removal of a frequency band surrounding the carrier frequency from the audio signal as set forth in claims 1 to 20. Thus, the issue before us is:

Has Appellant shown that the Examiner erred by finding that the applied references teach removal of a frequency band surrounding the carrier frequency from the audio signal?

FINDINGS OF FACT

1. The notched frequency band in the audio signal 190 of Appellant's invention encompasses or surrounds the modulated carrier frequency 160 (i.e., 300 Hz to 3.8 kHz) and the masking signal frequency 170 (i.e., 6.6 kHz to 7.4 kHz) (Fig. 3; Spec. 5 and 6).

2. Best teaches a notched audio frequency band of 2.883 kHz to 3.417 kHz, a modulated carrier frequency band of 2.883 kHz to 3.417 kHz, and a masking signal frequency band of 1.0 kHz to 6.0 kHz (Figs. 1 and 2; Abstract; col. 2, ll. 17 to 41).

3. Neubauer describes a coding method that introduces an inaudible data signal into an audio signal IN. A pseudo-noise signal 106 and a data signal 104 are multiplied together to produce a frequency-spread data signal

that is in turn weighted at weighting block 112 with a masking threshold $w(\omega)$ formed from the input audio signal IN. Thereafter, the weighted data signal and the audio signal IN on line 120 are superimposed at superposition means 116 to form an output audio signal with an inaudible data signal (Fig. 1; Abstract; col. 9, ll. 1 to 51; col. 14, ll. 14 to 29).

PRINCIPLES OF LAW

Anticipation

Anticipation is established when a single prior art reference discloses expressly or under the principles of inherency each and every limitation of the claimed invention. *Atlas Powder Co. v. IRECO Inc.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999); *In re Paulsen*, 30 F.3d 1475, 1478-79 (Fed. Cir. 1994).

Obviousness

The Examiner bears the initial burden of presenting a prima facie case of obviousness, and the Appellant has the burden of presenting a rebuttal to the prima facie case. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

ANALYSIS

Anticipation

The method according to claims 30 to 33 generates a masking frequency that “falls entirely within” one portion of the range of the notched frequency band (FF 1). As indicated *supra*, Best describes a masking frequency (i.e., 1.0 kHz to 6.0 kHz) that encompasses or surrounds the notched frequency band (i.e., 2.883 kHz to 3.417 kHz) (FF 2).

The method according to claims 34 to 36 has audio information residing “outside” of the masking signal frequency range of 6.6 kHz to 7.4

kHz (FF 1). As indicated *supra*, Best describes audio information that resides only “inside” the masking signal frequency range.

Thus, we agree with Appellant that Best fails to disclose the noted method steps. It follows that anticipation has not been established by the Examiner because Best does not disclose each and every limitation of the claimed invention set forth in claims 30 to 36. *Atlas Powder Co.*, 190 F.3d at 1347; *Paulsen*, 30 F.3d at 1478-79.

Obviousness

Turning first to the obviousness rejections of claims 1, 2, 4, 5, 7 to 10, 12, 13, and 16 to 19, the Examiner acknowledges (Final Rej. 5) that Neubauer (FF 3) does not disclose removing a frequency band surrounding the carrier frequency from the audio signal. As indicated *supra* (FF 2), Best does not describe such a method step because the notched audio frequency band and the carrier frequency band are the same size.

A prima facie case of obviousness of the claimed subject matter set forth in dependent claims 3, 6, 11, 14, 15, and 20 has not been established by the Examiner because the teachings of the references to Boney and Bassani both fail to cure the noted shortcomings in the teachings of Neubauer and Best. *Oetiker*, 977 F.2d at 1445.

CONCLUSIONS OF LAW

Anticipation

Appellant has demonstrated that the Examiner erred by finding that Best generates a masking signal that falls entirely within one portion of the range of frequencies removed from the audio signal to produce a notched audio signal.

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Appellant has demonstrated that the Examiner erred by finding that Best describes audio information with a frequency residing outside of the frequency range of the masking signal.

Obviousness

Appellant has demonstrated that the Examiner erred by finding that the applied references teach removal of a frequency band surrounding the carrier frequency from the audio signal.

ORDER

The decision of the Examiner rejecting claims 30 to 36 under 35 U.S.C. § 102(b) is reversed. The decision of the Examiner rejecting claims 1 to 20 under 35 U.S.C. § 103(a) is reversed.

REVERSED

gvw

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